

Abstract of the Disclosure

Provided is a microwave tunable device including a ferroelectric/dielectric $(Ba_{1-x}, Sr_x)TiO_3$ (BST) thin film that
5 can reduce dielectric loss of a ferroelectric/dielectric BST thin film. The microwave tunable device of the present research includes: a substrate; and a ferroelectric/dielectric $(Ba_{1-x}, Sr_x)TiO_3$ (BST) thin film of a (111) direction which is formed on the substrate. The technology of this research
10 embodies a microwave tunable device by using a ferroelectric/dielectric BST thin film grown in the (111) direction to overcome the limitation of conventional technologies and improve the problem of dielectric loss.